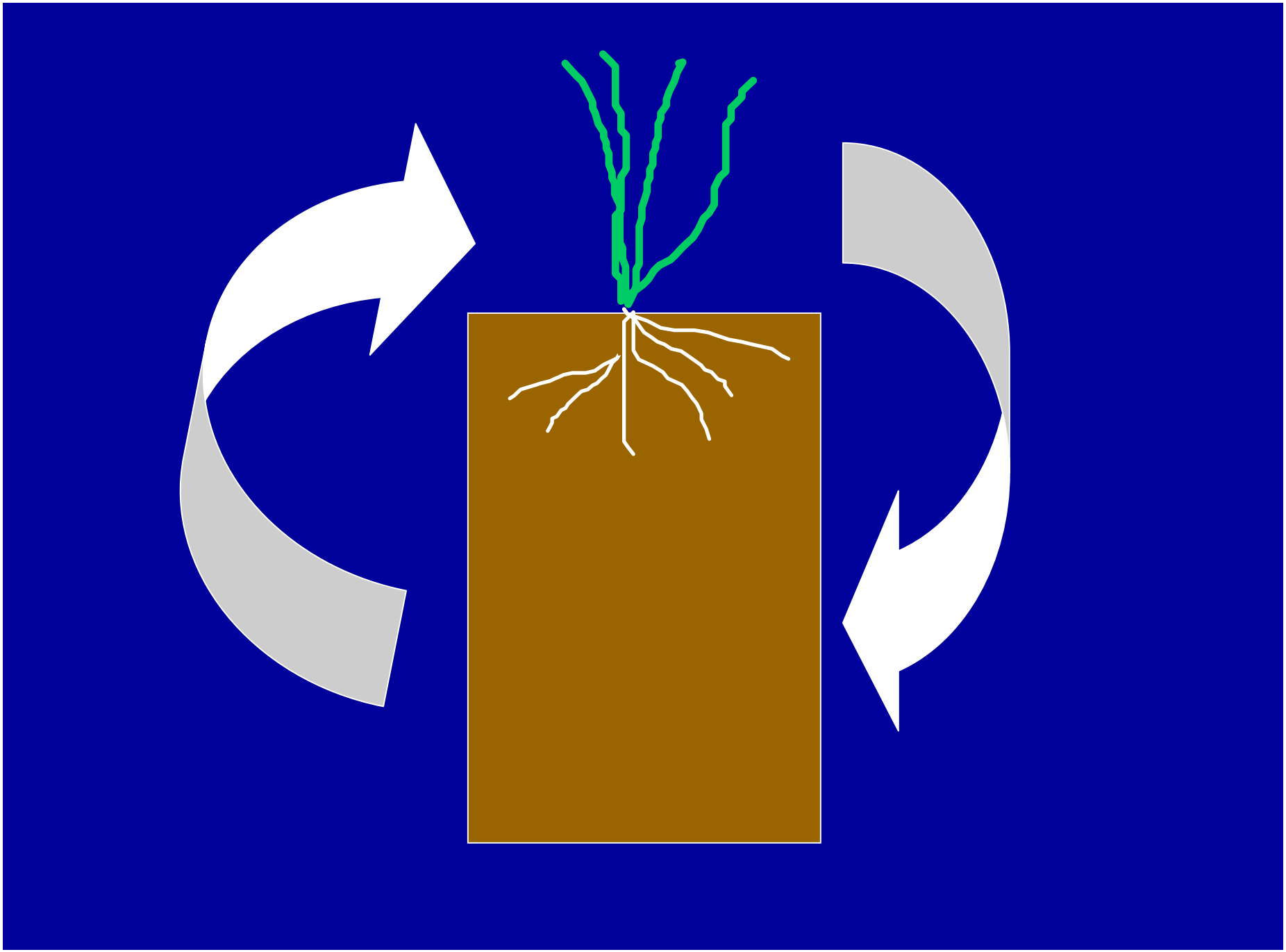

Managing soil conditions to enhance resistance to weed invasion in California grasslands

What makes plant communities resistant to invasive species?

Resident native species
- – diversity
- – density
- -- identity

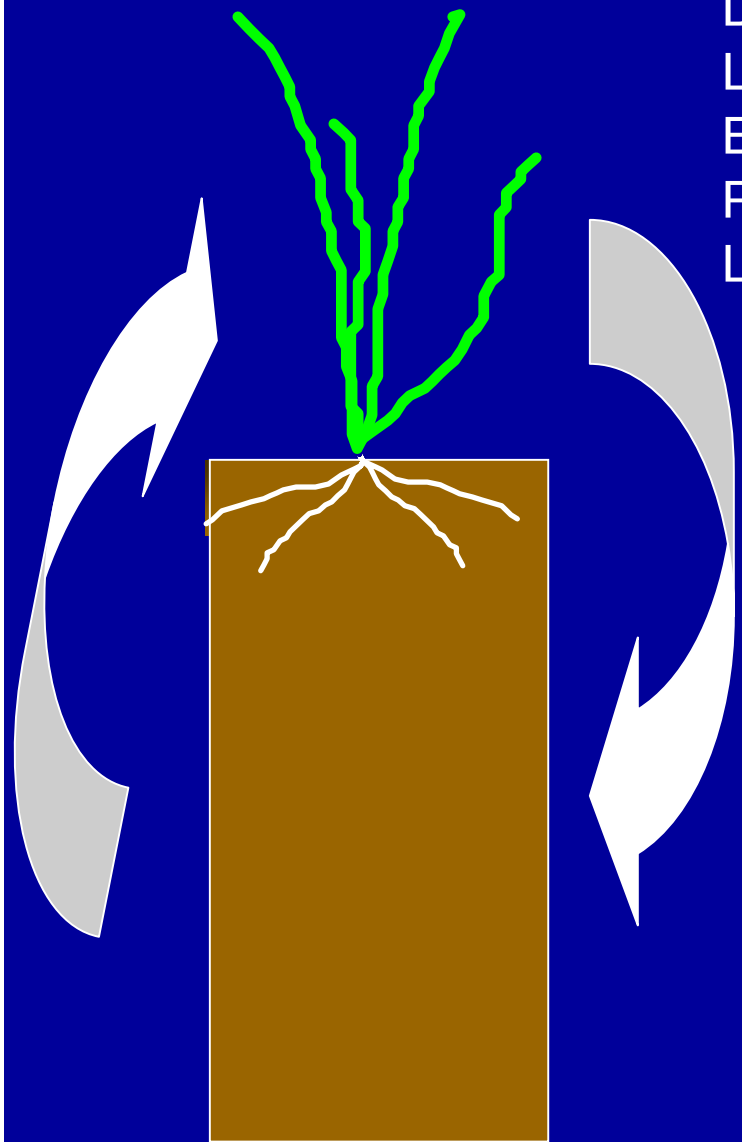
Soil resource availability
- – water
- – organic matter
- – limiting nutrients (N, P)
- – timing of availability
- – location of resources
- – microbes

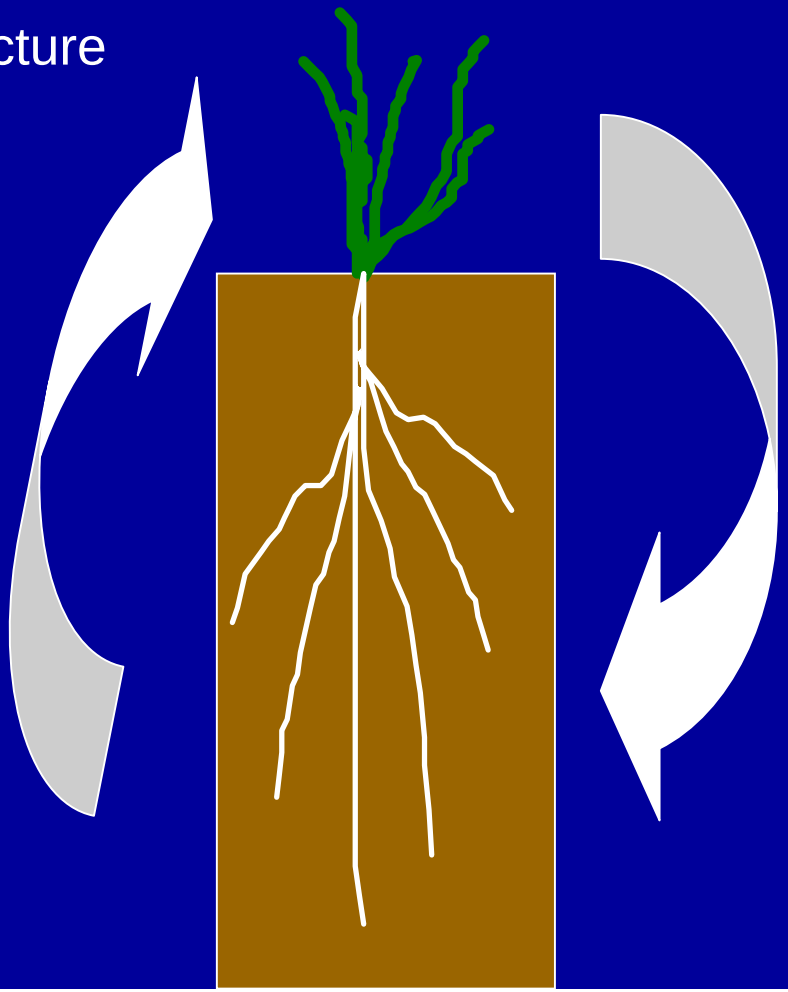


Invasive species

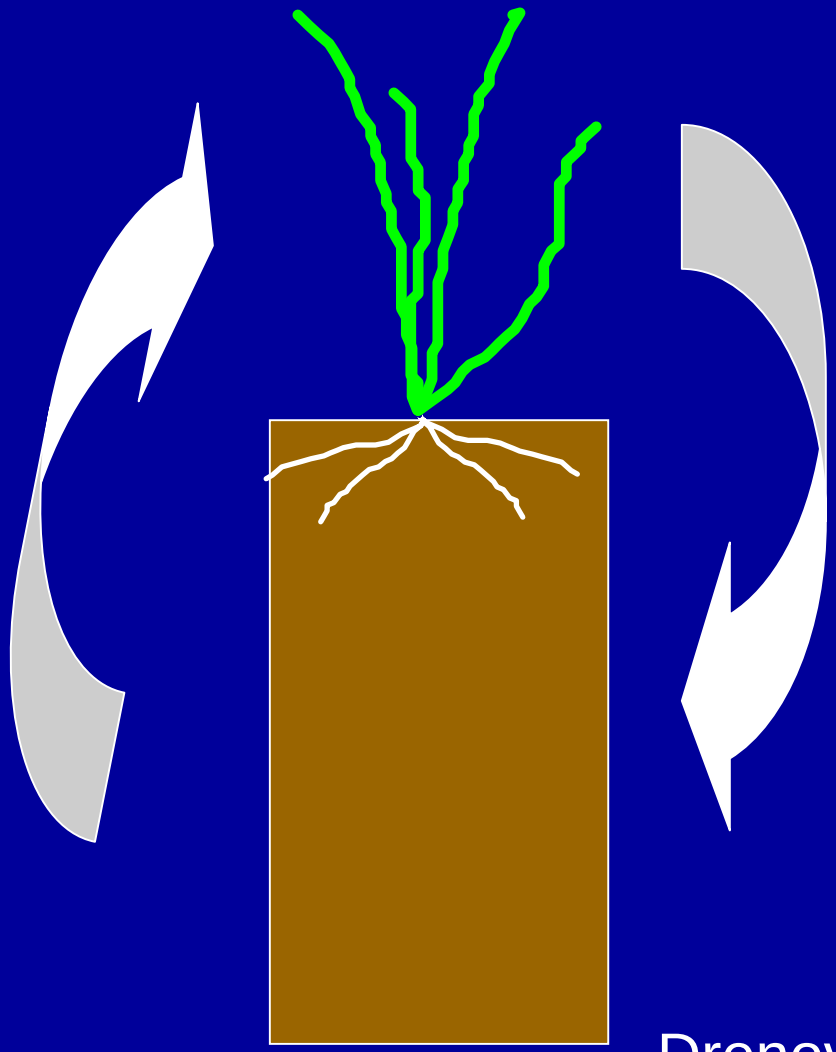
Native species

Differences:
Litter
Exudates
Root structure
Life cycle





Goatgrass

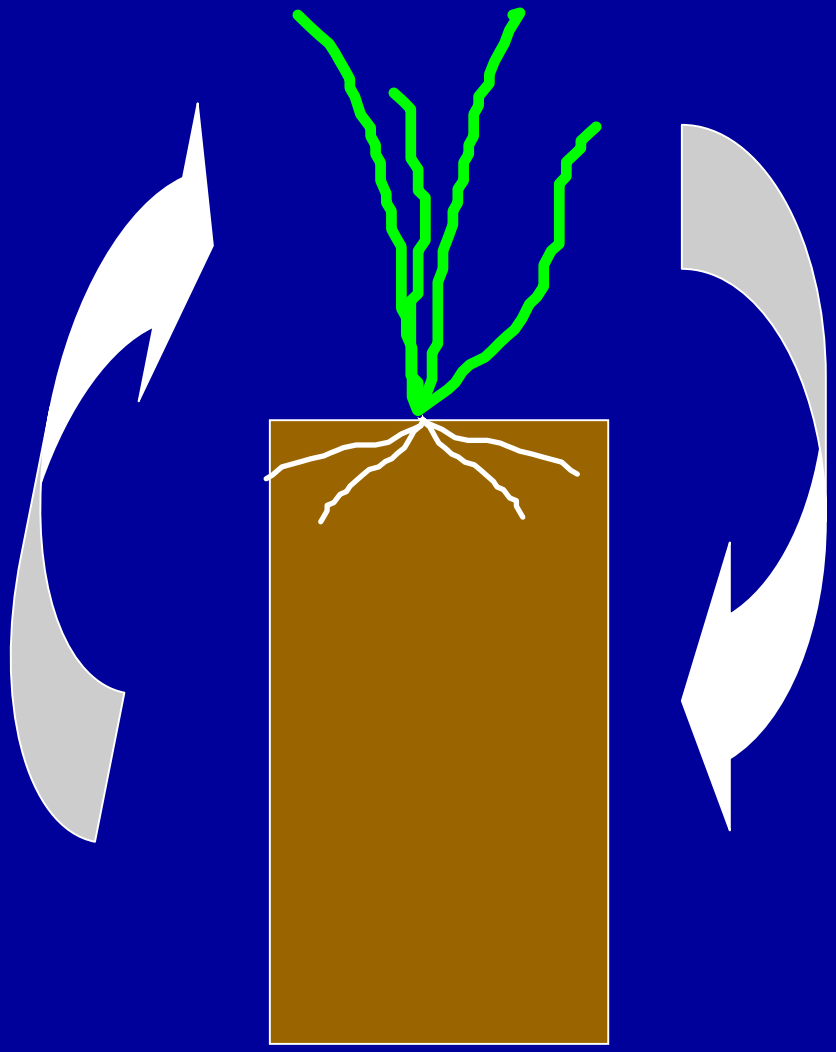


Slow C and N cycling rates

Low quality litter

Drenovsky and Batten 2007

Yellow starthistle and goatgrass



Change in microbial community

Root structure?

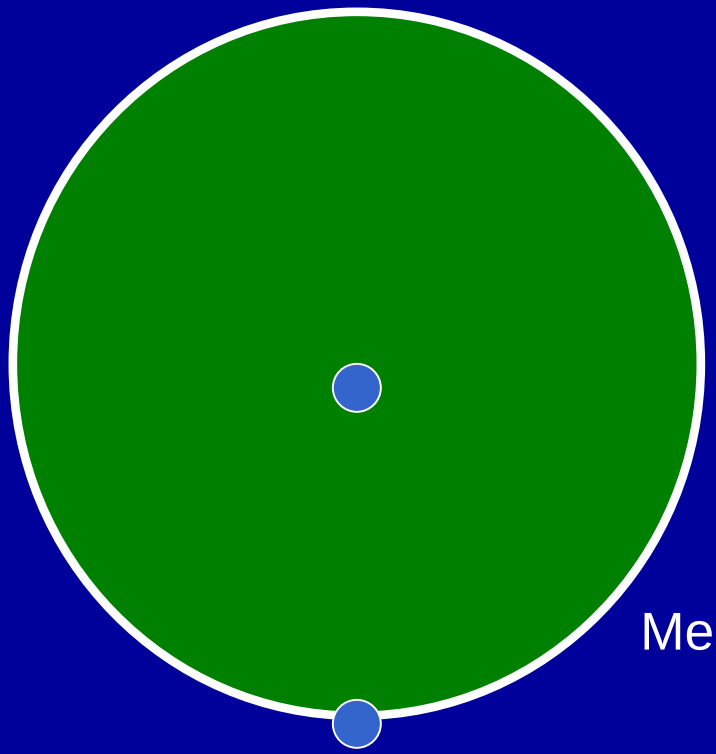
Root exudates?

Batten et al. 2006

Study objectives

- To determine if medusahead alters soil conditions in its favor
- To determine which soil conditions are altered in its favor
- To experiment with techniques for reversing these soil alterations

Task 1: Compare medusahead vs native grass soil conditions



Medusahead patch center

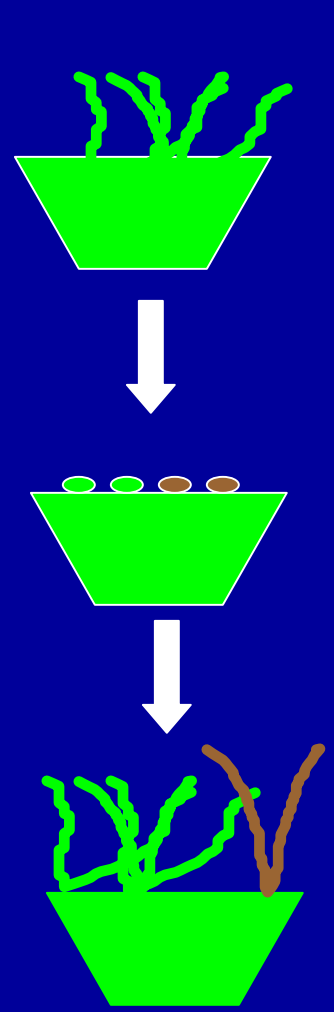
Medusahead patch edge

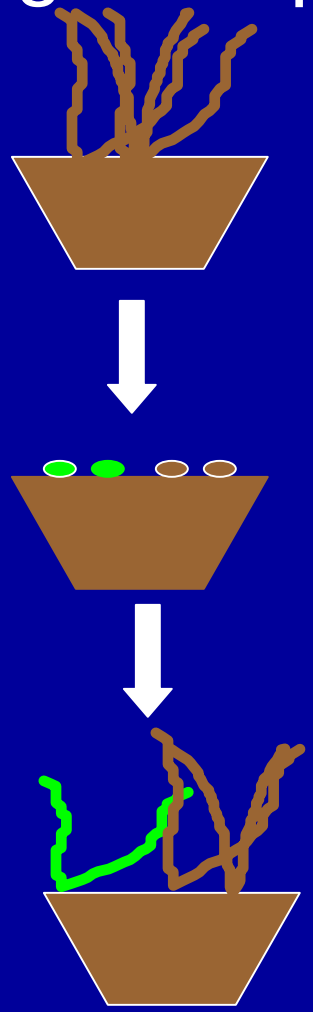
Surrounding native grass

Task 1: Compare medusahead vs native grass soil conditions

Task 2: Study competitive interactions of medusahead vs native grass species

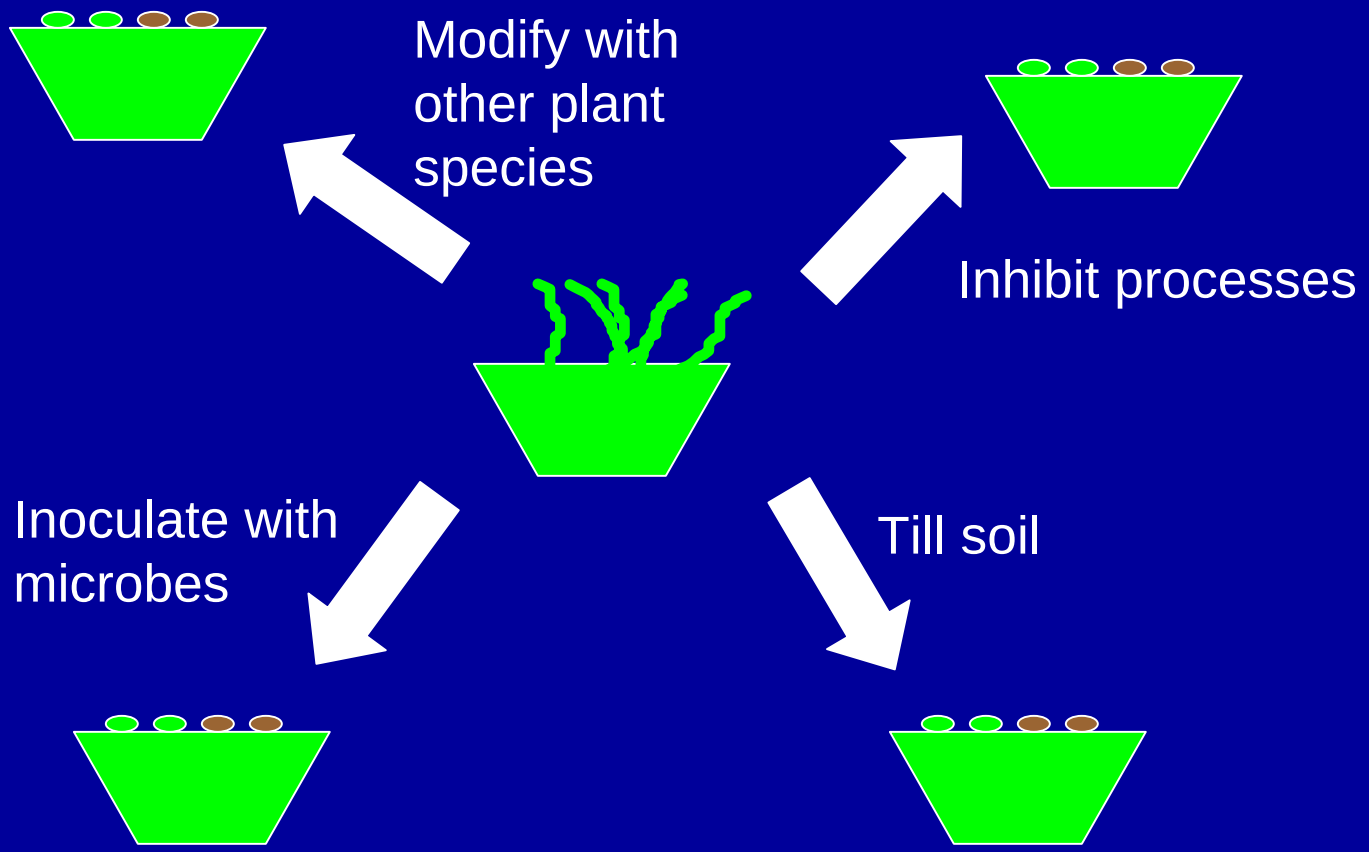
Medusahead soil





Nassella soil

Task 3: Experiment with soil management techniques to favor native species



Managing soil to control invaders

Young et al. 1998

Corbin and D’Antonio 2004; Averett et al. 2004

The long term goals

- To determine if managing soil conditions is an essential component of weed prevention
- To develop techniques for managing soil for weed resistance

Thank you!

- California Department of Food and Agriculture
- Tanya Meyer, Yolo Resource Conservation District
- Audubon California Landowner Stewardship Program
- Hedgerow Farms
- Valerie Eviner

Help!

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